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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,656	04/04/2006	Sang Ik Lee	K-0789	7608
34610 7590 09/02/2008 KED & ASSOCIATES, LLP P.O. Box 221200 Chantilly, VA 20153-1200				
EXAMINER				
RAHIM, AZIM				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
09/02/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/574,656

**Applicant(s)**

LEE ET AL.

**Examiner**

AZIM RAHIM

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 1/11/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 4/4/2006, 5/11/2008, 1/11/2008
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1-25 are objected to because of the following informalities: Regarding claim 1, line 2, the recitation “circulating insides” should be corrected to recite --circulating inside--. Also in lines 6 and 7, the recitation “for selective direction of the cold air in upward or downward” should be corrected to recite --for selective direction of the cold air in an upward or downward direction--. In claim 12, line 2, the recitation “circulating insides” should be corrected to recite --circulating inside--, and in line 5, the recitation “on outsides” should be corrected to recite --on the outside--. Regarding claim 18, line 2, the recitation “to one side circumferences of the fins” should be corrected to recite --to one side of the fins--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeon (US 5,941,085).

Regarding claim 1, Jeon discloses a refrigerator [figure 2] comprising: a cold air duct (140) for receiving cold air circulating insides of a refrigerating chamber and a freezing chamber; an evaporator (160) in the cold air duct [illustrated in figure 2]; at least one defrosting heater (170) in the cold air duct [illustrated in figure 2] for selective emission of heat; a fan [185] in the cold air duct [illustrated in figure 2], for selective direction of the cold air in upward or downward, a motor [185] for driving the fan; and open/close part (290) disposed at the upper side of the space [illustrated in figure 2] for closing a space having the evaporator, the defrosting heater, and the fan positioned therein, selectively.

Regarding claim 7, Jeon discloses that the fan is positioned over the evaporator [as illustrated in figure 2, the fan is positioned above the evaporator].

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

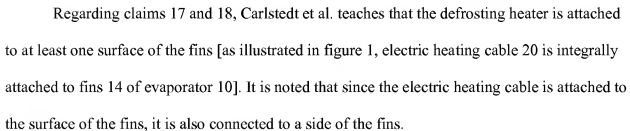
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1, 10-13, 17-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. in view of Carlstedt et al. (US 5,765,384).

Regarding claims 1, 10-13 and 22, Schenk et al. disclose a refrigerator [figures 1 and 2] comprising: a cold air duct (46) for receiving cold air circulating inside of a refrigerating chamber (22) and a freezing chamber (24) [illustrated in figure 2]; a fan (40) in the cold air duct [illustrated in figure 2], for selective direction of the cold air in upward or downward [the fan is capable of performing the intended use of operation, which lends no structure to the claimed invention], a motor (42) for driving the fan downward [the motor is capable of performing the intended use of operation, which lends no structure to the claimed invention]; an evaporator (30) in the cold air duct [illustrated in figure 2] including; a refrigerant pipe [annotated in the figure below corresponding to conduit 32 in figure 2] having refrigerant flowing therethrough [column 4, lines 36-39], and fins [annotated in figure below] on an outside of the refrigerant pipe [illustrated below]; and open/close means (48) for closing a space, having the evaporator and the fan positioned therein, selectively [the open/close means is capable of performing the intended use of operation, which lends no structure to the claimed invention].

Schenk et al. fail to disclose at least one defrosting heater in the cold air duct in contact with the fins for selective emission of heat; wherein the defrosting heater includes; a hot wire for functioning as a resistance body connected to a power source for emission of heat, and a film of an electrical insulating material surrounding an outside of the hot wire.

Carlstedt et al. teach the concept of providing an evaporator (10) having an electric cable (20) for defrosting the evaporator [see abstract]; wherein electric current is conducted through a resistance wire (24) [see column 2, lines 3-5], having a thin film (insulation 26) surrounding the resistance wire [illustrated in figure 1].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Schenk et al. to include the defrost heater as taught by Carlstedt et al. in order to prevent ice buildup on the evaporator from clogging the cold air duct, thus increasing cooling efficiency.



Regarding claim 19, Schenk et al. as modified by Carlstedt et al. teach all the limitations of the claimed invention, but fail to teach that the defrosting heater has pass through holes for pass through of the refrigerant pipes.

The general concept of providing a defrosting heater having pass through holes for pass through of the refrigerant pipes of an evaporator falls within the realm of common knowledge as obvious mechanical expedient, and one having ordinary skill in the art would have been motivated to include the use of a defrosting heater having pass through holes for pass through of the refrigerant pipes of an evaporator in order to conserve space within the cold air duct, enabling the evaporator and defroster to fit into more compact spaces.

Regarding claim 20, Schenk et al. as modified by Carlstedt et al. teach all the limitations of the claimed invention, but fail to teach that the fins of the evaporator have insertion slots in side surfaces for inserting the defrosting heater.

The general concept of providing fins of the evaporator having insertion slots in side surfaces for inserting the defrosting heater falls within the realm of common knowledge as obvious mechanical expedient, and one having ordinary skill in the art would have been motivated to include the use of fins of the evaporator having insertion slots in side surfaces for inserting the defrosting heater in order to conserve space within the cold air duct, enabling the evaporator and defroster to fit into more compact spaces.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Schenk et al. (US 6,694,754).



Regarding claim 2, Jeon discloses all the limitations of the claimed invention, but fails to disclose a second open/close part on a lower side of the space.

Schenk et al. teach the concept of providing a damper (48) in a lower side of a cooling space [illustrated in figure 2].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Jeon to include the second open/close part as taught by Schenk et al. in order to advantageously control the amount of air entering the cooling chamber based on the temperature of the interior of the enclosed space, thus increasing operating efficiency.

8. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as modified by Schenk et al. as applied to claim 2 above, and further in view of Kim et al. (US 5,987,904).

Regarding claim 3, Jeon as modified by Schenk et al. teach all the limitations of the claimed invention, but fail to teach the limitation of providing a supporting plate having a plurality of openings, and a plurality of rotating plates each having one side coupled to the supporting plate with a hinge, and the other side rotatable upward by a predetermined angle.

Kim et al. teach the concept of providing an opening closing device (50) including supporting plate (56c) having a plurality of openings [space between plates 52], and a plurality of rotating plates (52) each having one side coupled to the supporting plate with a hinge (pivot pin

61) [illustrated in figures 5 and 6], and the other side rotatable upward by a predetermined angle [illustrated in figure 6].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the upper and lower open/close devices the refrigerator of Jeon as modified by Schenk et al. to with the opening/closing device as taught by Kim et al. in order to provide additional control of the direction of airflow, thus increasing cooling efficiency.

Regarding claim 4, Kim et al. teach that the rotating plate is constructed from a thin plate [illustrated in figures 5 and 6], so that the rotating plate is rotated upward by a predetermined angle to open the opening when the cold air is directed upward by the fan [the rotating plate is capable of performing this function].

Regarding claim 5, Kim et al. teach that the rotating plate has a size enough to cover an upper circumference of the opening for closing the opening when the cold air is directed downward by the fan. [as illustrated in figures 5 and 6, it appears that plates 52 will close the area between each of the plates]

Regarding claim 6, Kim et al. teach that the rotating plate is held by a rear end of an adjacent rotating plate and the supporting plate [as illustrated in figures 5 and 6, it appears that when plates 52 are rotated to their vertical position, the unattached ends of plates 52 will have contact with hinges 61], for preventing the rotating plate from rotating downward [the rotating plates 52 as illustrated in figure 5 are capable of performing this operation].

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Mitani et al. (US 4,569,206).

Regarding claim 8, Jeon discloses all of the limitations of the claimed invention, and further discloses a defrost heater (170) disposed below the evaporator [illustrated in figure 2].

Jeon fail to disclose that the defrosting heater is positioned between the fan an the evaporator.

Mitani et al. teach the concept of positioning a defrost heater (46) between an evaporator (14) and a fan (15) [illustrated in figures 4a, 4b and 8].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Jeon to instead position the defrost heater between the evaporator and fan as taught by Mitani et al. in order to heat defrost the damper positioned above the heater, thus preventing freeze up of the damper when cooling operation is called upon.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Block (US 2002/0192075).

Regarding claim 9, Jeon discloses all of the limitations of the claimed invention, but fails to disclose that the defrosting heater is fabricated as one unit with the fan.

Block teaches the concept of providing a heater (15) on impeller blades (12) of a fan (11) [see paragraph 22].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator fan of Jeon to include the heater as taught by Block in order to prevent freeze up of the shaft of the fan when cooling operation is called upon, thus increasing the operational efficiency of the refrigerator.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claim 13 above, and further in view of Lindseth (US 2000,467).

Regarding claim 14, Schenk et al. as modified by Carlstedt et al. teach all of the limitations of the claimed invention, and Carlstedt et al. teach that the hot wire is bent [illustrated in figure 1, bent in the shape of the conduit]

Schenk et al. as modified by Carlstedt et al. fail to teach that the hot wire is a carbon hot wire.

Lindseth teaches that it is well known in the art to have a portion of a heating element being made of carbon [see column 2, lines 35-38].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hot wire of Schenk et al. as modified by Carlstedt et al. to include the carbon as taught by Lindseth in order to reduce the noise generated by the power

source and to withstand higher tolerances, thus increasing heating efficiency.

12. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claims 12 and 13 above, and further in view of Komatsu (US 5,594,585).

Regarding claims 15 and 16, Schenk et al. as modified by Carlstedt et al. teach all of the limitations of the claimed invention, but fail to teach that the film is formed of PET material and wherein the defrosting heater is a PTC device.

Komatsu teaches the concept of using a positive temperature coefficient thermistor (PTC) heater as a heating device [column 3, lines 41-46] and laminating the PTC heater with a PET film [column 3, lines 46-49].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the film of Schenk et al. as modified by Carlstedt et al. to be made of the PET material as taught by Komatsu in order to prevent the while of the cold air duct from being heated, thus increasing cooling efficiency.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the defrost heater of Schenk as modified by Carlstedt et al. with the PTC device as taught by Komatsu in order to regulate the defrost temperature without a temperature control circuit, thus increasing efficiency.

13. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claim 12 above, and further in view of Jeon.

Regarding claim 21, Schenk et al. as modified by Carlstedt et al. teach all the limitations of the claimed invention, but fail to teach an open/close means provided in an upper portion of the space.

Jeon teaches the concept of providing an open/close means (290) being provided in the upper portion of a cold air duct (140) [illustrated in figure 2].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Schenk et al. as modified by Carlstedt et al. to include the open/close means disposed in an upper portion of the cold air duct as taught by Jeon in order to selectively prevent the escape of warmer air from the freezing chamber into the cold air duct, thus increasing cooling efficiency.

14. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. and Jeon as applied to claim 22 above, and further in view of Kim et al.

Regarding claim 23, Schenk et al. as modified by Carlstedt et al. and Jeon teach all the limitations of the claimed invention, but fail to teach the limitation of providing a supporting plate having a plurality of openings, and a plurality of rotating plates each having one side

coupled to the supporting plate with a hinge, and the other side rotatable upward by a predetermined angle.

Kim et al. teach the concept of providing an opening closing device (50) including supporting plate (56c) having a plurality of openings [space between plates 52], and a plurality of rotating plates (52) each having one side coupled to the supporting plate with a hinge (pivot pin 61) [illustrated in figures 5 and 6], and the other side rotatable upward by a predetermined angle [illustrated in figure 6].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the upper and lower open/close devices the refrigerator of Schenk et al. as modified by Carlstedt et al. and Jeon to with the opening/closing device as taught by Kim et al. in order to provide additional control of the direction of airflow, thus increasing cooling efficiency.

Regarding claim 24, Kim et al. teach that the rotating plate is constructed from a thin plate [illustrated in figures 5 and 6], so that the rotating plate is rotated upward by a predetermined angle to open the opening when the cold air is directed upward by the fan [the rotating plate is capable of performing this function].

Regarding claim 25, Kim et al. teach that the rotating plate has a size enough to cover an upper circumference of the opening for closing the opening when the cold air is directed downward by the fan. [as illustrated in figures 5 and 6, it appears that plates 52 will close the area between each of the plates]

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681 or Cheryl Tyler at 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./  
Examiner, Art Unit 3744  
9/2/2008

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3744